BostonElectronics

VS3 Detector Set

Room temperature, fast 1x1mm LWIR set, small size, for <2 to 11+ microns, DC to 100MHz bandwidth and variable gain

- PVM-10.6-1x1
- SIP-DC-100M-G
- PPS-03

Photovoltaic multiple junction detectors PVM

PVM series features room temperature and TE cooled IR multiple junction photovoltaic detectors.

Detector type	Cooling, operating temperature $T[K]$	Optimal wavelength*) $\lambda_{opt}[\mu m]$	Detectivity**) $D^*\left[\frac{cm\cdot\sqrt{Hz}}{W}\right]$		Current responsivity length product $R_i\cdot L\left[\frac{A\cdot mm}{W}\right]$	Time constant $\tau[ns]$	Resistance $R[\Omega]$	Acceptance angle $\varnothing[°], \frac{1}{2NA}$	Optical area***) $[mm\times mm]$	Package	Window****)
			@λ_{peak}	@λ_{opt}							
PVM	uncooled, ~300	8	≥1.2×10^8	≥6.0×10^7	≥0.008	≤4	50 to 300	≥90, 0.71	0.1×0.1 0.2×0.2 1×1 2×2 3×3 4×4 1)	BNC, TO39	no window
		10.6	≥2.0×10^7	≥1.0×10^7	≥0.002	≤1.5	20 to 150				
	two-stage TE-cooled (2TE), ~230	8	≥6.0×10^8	≥3.0×10^8	≥0.015	≤4	150 to 1000	~70, 0.87		TO8, TO66	wedged ZnSe AR coated
		10.6	≥2.0×10^8	≥1.0×10^8	≥0.006	≤3	90 to 350				

*) *Other optimal wavelengths available upon request.*
**) *Data sheet states minimum guaranteed D* values for each detector model. Higher performance detectors can be provided upon request.*
***) *Other optical area available upon request.*
****) *Other windows available upon request.*
1) *Optical area available only for uncooled detectors.*

Photovoltaic detectors optically immersed PVMI

PVMI series features room temperature and TE cooled IR multiple junction photovoltaic detectors, optically immersed (achieved by using high refractive index micro lenses) in order to improve performance of the devices, different acceptance angle and saturation level. Both PVM and PVMI devices are optimized for the maximum performance at opt. Highest performance and stability are achieved by application of variable gap HgCdTe semiconductor, optimized doping and sophisticated surface processing.

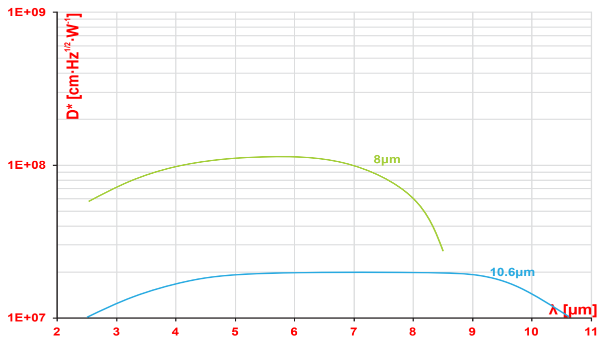
Detector type	Cooling, operating temperature $T[K]$	Optimal wavelength*) $\lambda_{opt}[\mu m]$	Detectivity**) $D^*\left[\frac{cm\cdot\sqrt{Hz}}{W}\right]$		Current responsivity length product $R_i\cdot L\left[\frac{A\cdot mm}{W}\right]$	Time constant $\tau[ns]$	Resistance $R[\Omega]$	Acceptance angle $\varnothing[°], \frac{1}{2NA}$	Optical area***) $[mm\times mm]$	Package	Window****)
			@λ_{peak}	@ λ_{opt}							
PVMI	uncooled, ~300	8	≥6.0×10^8	≥3.0×10^8	≥0.04	≤4	50 to 300	~36, 1.62	1×1 2×2	BNC, TO39	no window
		10.6	≥2.0×10^8	≥1.0×10^8	≥0.01	≤1.5	20 to 150				
	two-stage TE-cooled (2TE), ~230	8	≥2.5×10^9	≥2.0×10^9	≥0.10	≤4	150 to 1000			TO8, TO66	wedged ZnSe AR coated
		10.6	≥1.5×10^9	≥1.0×10^9	≥0.05	≤3	90 to 350				
	three-stage TE-cooled (3TE), ~210	8	≥4.0×10^9	≥3.0×10^9	≥0.15	≤4	200 to 1500				
		10.6	≥2.0×10^9	≥1.5×10^9	≥0.10	≤3	100 to 400				
	four-stage TE-cooled (4TE), ~195	8	≥8.0×10^9	≥6.0×10^9	≥0.20	≤4	500 to 2000				
		10.6	≥2.5×10^9	≥2.0×10^9	≥0.15	≤3	120 to 500				

*) *Other optimal wavelengths available upon request.*
**) *Data sheet states minimum guaranteed D* values for each detector model. Higher performance detectors can be provided upon request.*
***) *Other optical area available upon request.*
****) *Other windows available upon request.*

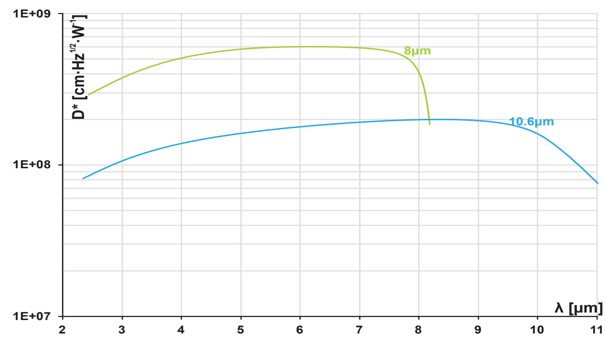



Spectral characteristics*)

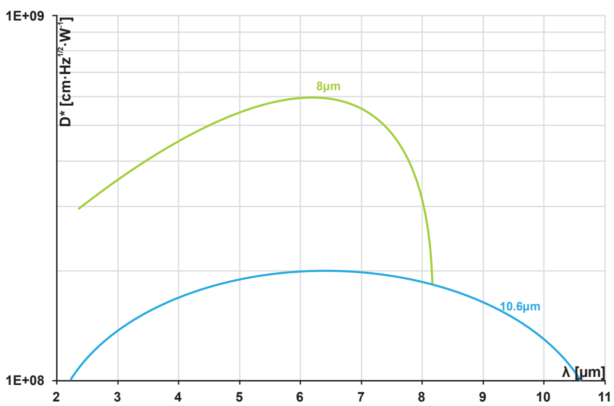
PVM



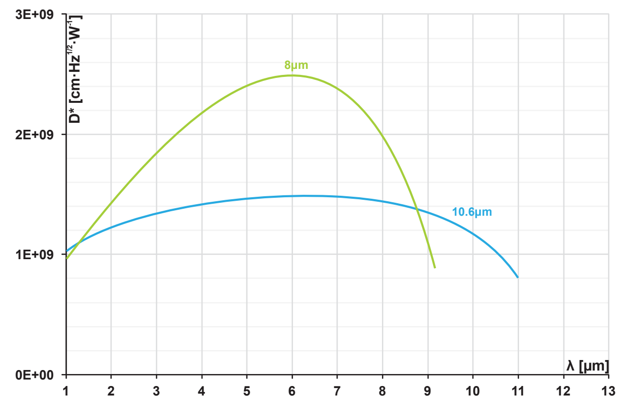
PVM-2TE



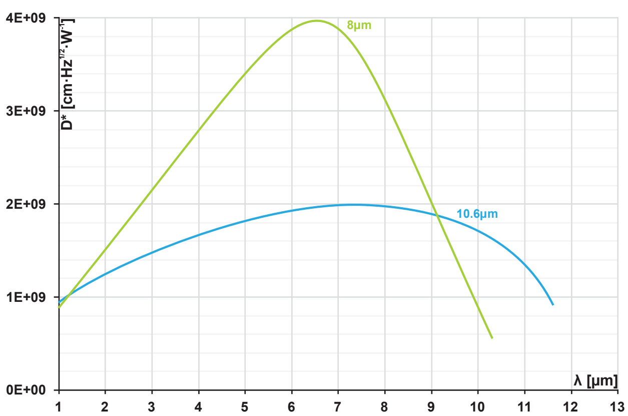
PVMI



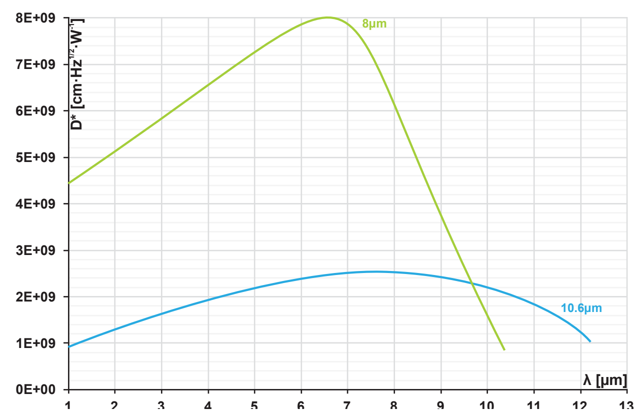
PVMI-2TE



PVMI-3TE



PVMI-4TE



*) *Example of D* vs wavelength λ for HgCdTe detectors.*
Spectral characteristics of individual detectors may vary from those shown on the chart.

SIP preamplifier

SIP is the ultra small transimpedance, AC or DC coupled preamplifier. It is designed to operate with either biased and non-biased detectors. It is compatible with uncooled detectors in TO39 package or thermoelectrically cooled detectors in TO8 package. SIP is dedicated for OEM applications and requires external heat sink (MHS-2). There is possibility to adjust gain (devices with bandwidth up to 100MHz).

Code description

SIP - 10k - 100M - TO8 - G

see the preamplifier specification table for additional information

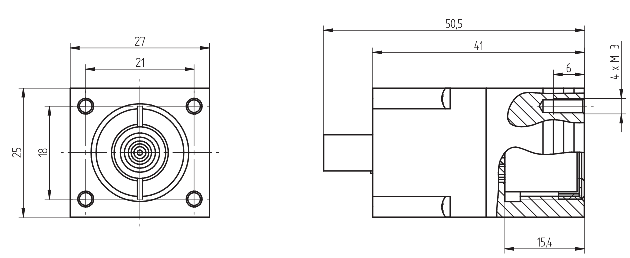
- SIP: VIGO preamplifier type
- 10k: Low cut-off frequency f_{lo} [Hz]: DC, 10, 100, 1k, 10k
- 100M: High cut-off frequency f_{hi} [Hz]: 100k, 300k, 1M, 5M, 10M, 100M, 250M
- TO8: Package: TO8 - with cooled detectors in TO8 package; TO39 - with uncooled detectors inTO39 package
- G: Gain adjustment: G - with gain adjustment *); NG - without gain adjustment

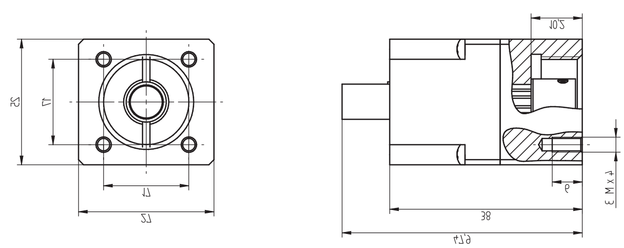
*)Available only for fni up to 100Mhz.

Dimensions [mm]

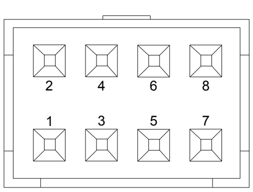
SIP-TO8

SIP-TO39





Power supply and TEC control connector - AMP2x4 connector male



Pin number	Symbol	Function
1	$-V_{sup}$	power supply input (–)
2*)	TH2/N.C.	thermistor output/not connected
3**)	DATA/GND	data pin/power ground
4*)	TEC–/N.C.	TEC supply input (–)/not connected
5	GND	power ground
6*)	TH1/N.C.	thermistor output/not connected
7	$+V_{sup}$	power supply input (+)
8*)	TEC+/N.C.	TEC supply input (+)/not connected

*) N.C for SIP-f_{lo}-f_{hi}-TO39
**) GND for SIP-f_{lo}-f_{hi}-TO39

Preamplifier type	Main feature	Detector package	Detector type	Detector cooling	Radiator, cooling, TEC controlling	Input noise voltage density	Input noise current density	Low cut-off frequency
						$e_n\left[\frac{nV}{\sqrt{Hz}}\right]$	$i_n\left[\frac{pA}{\sqrt{Hz}}\right]$	$f_{lo}[Hz]$
VIP	standalone	BNC	PV, PVI, PVM, PVMI	uncooled	not needed	0.97 – 8.0[1)]	0.02 – 3.5[1)]	DC, 10, 100, 1k, 10k
µIP	micro-size	TO39	PC, PCI, PV, PVI, PVM, PVMI	uncooled	not needed	0.97 – 8.0[1)]	0.02 – 3.5[1)]	DC, 10, 100, 1k, 10k
QIP	four-channel	TO8	PCQ, PVQ, PVMQ	uncooled	on board radiator and TEC controller, fan	0.97 – 8.0[1)]	0.02 – 3.5[1)]	DC, 10, 100, 1k, 10k
SIP	ultra-small, OEM	TO39 TO8	PC, PCI, PV, PVI, PVM, PVMI	uncooled 2TE, 3TE, 4TE	external heatsink needed	0.97 – 8.0[1)]	0.02 – 3.5[1)]	DC, 10, 100, 1k, 10k
FIP	very fast	TO8	PC, PCI, PV, PVI, PVM, PVMI	2TE, 3TE, 4TE	on board radiator, fan	1.1	5.0	1k, 10k
MIP	standard	TO8	PC, PCI, PV, PVI, PVM, PVMI	2TE, 3TE, 4TE	on board radiator, fan	0.97 – 8.0[1)]	0.02 – 3.5[1)]	DC, 10, 100, 1k, 10k
PIP	programmable	TO8	PC, PCI, PV, PVI, PVM, PVMI	2TE, 3TE, 4TE	on board radiator, fan	0.95	4.5 7.0	DC/10
AIP	on board TEC controller	TO8	PC, PCI, PV, PVI, PVM, PVMI	2TE, 3TE, 4TE	on board radiator and **TEC controller**, fan	0.97 – 8.0[1)]	0.02 – 3.5[1)]	DC, 10, 100, 1k, 10k

1) *noise measurement frequency* $f_0 = 10kHz$
2) *first stage transimpedance* $= 1k\Omega$
3) *first stage transimpedance* $= 5k\Omega$
4) *transimpedance range* $\frac{K_{imax}}{K_{imin}}$ up to 5 (dependent on f_{hi})
5) $f_{hi} \leq 1MHz$, *load resistance* $R_L = 1M\Omega$
6) $f_{hi} > 1MHz$, *load resistance* $R_L = 50\Omega$

High cut-off frequency	Transimpedance	Output impedance	Output voltage swing	Output voltage offset	Power supply voltage	Power supply current	Supply connector	Signal output
$f_{hi}[Hz]$	$K_i\left[\frac{V}{A}\right]$	$R_{out}[\Omega]$	$V_{out}[V]$	$V_{off}[mV]$	$V_{sup}[V]$	$I_{sup}[mA]$		
100k, 300k, 1M, 5M, 10M, 20M	fixed up to 1.0×10^5	50	±10[5)] ±2[6)]	max ±20[9)]	±15[12)] ±9[13)]	max ±25	DB9	BNC
100k, 300k, 1M, 5M, 10M, 100M, 200M	fixed up to 1.0×10^5	50	±2[5)] ±1[6)]	max ±20[9)]	±9	max ±50	MOLEX1×3	MMCX
100k, 300k, 1M, 5M, 10M, 100M	fixed up to 2.0×10^5	50	±2[5)] ±1[6)]	max ±20[9)]	+5	max ±50	DC 2.1/5.5	**4×MCX**
100k, 300k, 1M, 5M, 10M, 100M, 250M	tunable[4)] up to 1.0×10^5	50	±10[5)] ±1[6)]	max ±20[9)]	±15[12)] ±9[13)]	max ±50	AMP2×4	MMCX
1G	fixed up to 8.5×10^3	50	±1	-	+12/-5	+100 -50	LEMO	SMA (**DC monitor as an option**)
100k, 300k, 1M, 5M, 10M, 100M, 250M	fixed up to 2.0×10^5	50	±10[5)] ±2[7)] ±1[8)]	max ±20[9)]	±15[12)] ±9[13)]	max ±50	LEMO	SMA
150k/1.5M/20M 1.5M/15M/200M	digitally adjustable 500 – 30k[2)] 2.5k – 150k[3)]	50	±1	max ±20[9] (DC) max ±10 (AC)	±9	typ ±80 max ±100	LEMO	SMA
100k, 300k, 1M, 5M, 10M, 100M, 250M	fixed up to 2.0×10^5	50	±2[5)] ±1[6)]	max ±20[9)]	+5[10)] +12[11)]	max ±50	DC 2.1/5.5	2×SMA (**DC monitor as an option**)

7) $1MHz < f_{hi} \leq 20MHz$, *load resistance* $R_L = 1M\Omega$

8) $20MHz < f_{hi} \leq 250MHz$, *load resistance* $R_L = 50M\Omega$

9) *Measured with equivalent resistor at the input instead of the detector. It's to avoid the environmental thermal radiation's impast*

10) *with uncooled*, 2TE *and* 3TE *detectors*

11) *with* 4TE *detectors*

12) $f_{hi} \leq 1MHz$

13) $f_{hi} > 1MHz$

PPS-03 is a small size preamplifier power supply, designed to operate with VIGO IR detection modules with uncooled detectors (VIP, SIP-TO39, uIP)

Specification

Parameter	Vaule
Power supply voltage V_{sup} [V AC]	100 to 240 (50Hz to 60Hz)
Output voltage [V DC]	±15, ±9,+12, -5
Output current [mA]	±100
Weight [g]	100

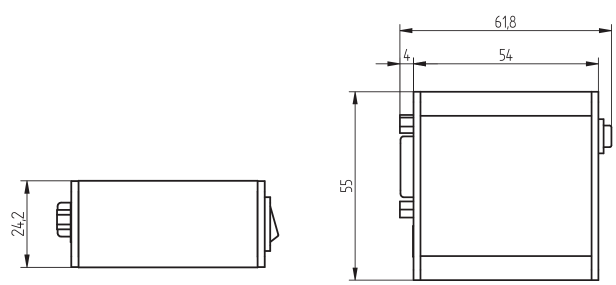
Code description

PPS-03-09

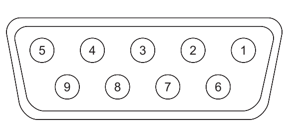
VIGO preamplifier power supply type

Power supply:
09 - ±9V
15 - ±15V
G1 - combined +12V, -5V

Dimensions [mm]



Power supply connector - DB9 connector female



Pin number	Symbol	Function
1	N.C.	not connected
2	N.C.	not connected
3	GND	power ground
4	N.C.	not connected
5	N.C.	not connected
6	$-V_{sup}$	power supply output (–)
7	N.C.	not connected
8	N.C.	not connected
9	$+V_{sup}$	power supply output (+)
metal cover	GND-SH	shield